

REMARKS

Reconsideration and allowance of the above-identified application, as currently amended, is respectfully requested.

Revisions were implemented in the Specification that are of a minor formal nature. For example, the continuing data information in the opening paragraph on page 1 of the Specification has been updated, accordingly. Several additional changes were also effected that are of a minor grammatical/editorially clarifying nature as well as to correct obvious informalities. It is submitted these changes do not involve the presenting of new matter, either by addition and/or deletion. Therefore, acceptance/formal entry of the same is respectfully requested.

By the above-made amendments, claims 2 and 5 were amended and claims 3 and 4 were canceled. Accordingly, claims 1-2 and 5-6 remain pending. The revision effected in claim 2 corrects the misspelling of the term insulating. With regard to independent claim 5, the revision implemented therein is strictly of a minor formal nature, i.e., the expression "said thickness of said polycrystalline silicon semiconductor layer" was appropriately re-presented as the expression the thickness thereof of said polycrystalline silicon semiconductor layer. This change was effected to avoid any possible question of antecedent support for the expression "said thickness..." As is clearly apparent, the revision implemented in claim 5 does not alter the substantive nature of that claim.

With the canceling of claims 3 and 4, the previously standing rejection under 35 USC §103(a) directed thereto, it is submitted, was rendered moot. Applicants submit, however, agreeing to the canceling of these claims should not be construed as acquiescence with regard to the merits of the referred to previously standing art rejection directed thereto.

According to the outstanding Office Action, claims 1-2 and 5-6 stand rejected under 35 USC §103(a) as unpatentable over the combination of Yamazaki et al. (U.S. Patent No. 5,933,205) in view of Hasegawa (U.S. Patent No. 5,064,779) and further in view of either Takahashi et al. (U.S. Patent No. 5,712,496) or Ipri (U.S. Patent No. 4,597,160). As will be shown below, the invention according to these claims could not have been realizable from the combined teachings of these references including in the manner alleged in the body of this rejection. Accordingly, this rejection is traversed and reconsideration and withdrawal of the same is respectfully requested.

A key featured aspect of the LCD device set forth in each of the independent claims 1 and 5 is that *variations of positions of peaks of depth distributions of concentration of impurities introduced into said polycrystalline silicon semiconductor layer to determine a conductivity type thereof [are] within 10% of the thickness thereof of said polycrystalline silicon semiconductor layer, said positions of said peaks being with respect to a surface of said substrate*. This key featured aspect is discussed, for example, in connection with Figs. 1+ and especially Figs. 3-4 (see page 27, line 2 et seq. and page 29, line 23 et seq.; see also page 10, line 24 et seq.; page 12, line 23 et seq., of the Specification). Such, it is submitted, was neither taught nor suggested by any of the above-cited references or, for that matter, from their combined teachings.

It is admitted in the rejection that Yamazaki et al. does not teach the above set forth featured aspect. It is submitted, not only Yamazaki et al., but, also, Hasegawa et al., Takahashi et al., and Ipri, considered separately or in combination, fail to teach the above set forth featured aspect. In this regard, it is alleged in the rejection that "Hasegawa [indicates] that the surface should be smooth (as possible-abstract, and less than 10 angstroms in spec) and that [this] enables the ability to

control doping depth (column 6, lines 30-49)." The Examiner's assertion notwithstanding, Applicants submit, however, that Hasegawa et al.'s manufacturing scheme of a polycrystalline silicon film does not support such alleged structural aspects. For example, the assertion related to "less than 10 angstroms" could not be located in Hasegawa et al.'s Specification. However, the following descriptive statement is present in Hasegawa et al.: "the deposited silicon film has a very smooth surface, the surface roughness being 30 Å or less." (Column 3, lines 48-50, in Hasegawa et al.) Hasegawa et al. also states that "the surface of the formed silicon film was very smooth, i.e., 30 Å or less which is the lower limit detected by the surface roughness meter used." (Column 7, lines 34-36, in Hasegawa et al.) The mentioning of the surface roughness notwithstanding, Hasegawa et al. is silent regarding the thickness of the polycrystalline silicon film. It is apparent, therefore, that Hasegawa et al. failed to teach a percentage relation of the roughness amount to the thickness of the polycrystalline silicon film.

It is further alleged in the rejection that Hasegawa et al. teaches enabling the ability to control doping depth. In this regard, column 6, lines 30-49, in Hasegawa et al. are cited in support thereof. However, the referred to discussion in Hasegawa et al., however, does not, it is submitted, teach enabling the ability to control doping depth. Rather, this discussion is directed to a particular case related to a two-layer polycrystalline structure, consisting of a < 100 > oriented film and a < 110 > oriented film. It is submitted, Hasegawa et al. does not refer to the positions of peaks of depth distributions of concentration of impurities introduced into the polycrystalline semiconductor layer to determine a conductivity type thereof, as called for in each of independent claim 1 and 5 of the present invention.

In fact, none of the above-named cited references discloses or suggests utilization of the positions of peaks of depth distributions of concentration of

impurities for the purpose of controlling the doping of the impurities to be introduced into the polycrystalline silicon semiconductor layer to determine a conductivity type thereof. It is clearly evident, therefore, that even if one of ordinary skill, arguendo, would have considered these references in combination, the invention still could not have been realizable. That is, even in view of the combined teachings of Yamazaki et al., Hasegawa et al., Takahashi et al., and Ipri, it still would not have been obvious to achieve the LCD device according to independent claims 1 and 5 at least for the reason that such combination failed to teach the following key aspect thereof:

variations of positions of peaks of depth distributions of concentration of impurities introduced into said polycrystalline silicon semiconductor layer to determine a conductivity type thereof being within 10% of said thickness of said polycrystalline silicon semiconductor layer, said positions of said peaks being with respect to a surface of said substrate

Correspondingly, since claims 2 and 6 further limit the invention according to claims 1 and 5, they are also considered patentable for at least the same and similar reasons as that with regard to claims 1 and 5.

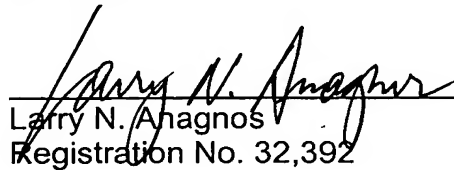
Therefore, in view of the amendments presented herein above, together with these accompanying remarks, reconsideration and withdrawal of the remaining art rejection as well as a favorable action on claims 1-2 and 5-6 and an early formal Notification of Allowability of the above-identified application is respectfully requested.

Enclosed herewith, also, is an Information Disclosure Statement (IDS) together with the fee amount directed thereto. Acceptance/formal entry therefor of the same is respectfully requested.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

To the extent necessary, applicants petition for an extension of time under 37 CFR §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including Extension of Time fees, to the Deposit Account of Antonelli, Terry, Stout & Kraus, LLP, Dep. Acct. No. 01-2135 (520.39294CX1), and please credit any excess fees to such deposit account.

Respectfully submitted,
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